CLAIMS

What is claimed is:

1. An optoelectronic assembly for a computer system, comprising:

an electronic chip set adapted for at least one of data processing, data switching, and data storage;

a substrate in communication with the electronic chip set;

an electrical signaling medium having a first end in signal communication with the substrate;

an optoelectronic transducer in signal communication with a second end of the electrical signaling medium; and

an optical coupling guide for aligning an optical signaling medium with the optoelectronic transducer;

wherein an electrical signal from the electronic chip set is communicated to the optoelectronic transducer via the substrate and the electrical signaling medium, and

wherein the electronic chip set and the optoelectronic transducer share a common thermal path for cooling.

2. The assembly of Claim 1, further comprising:

a heat spreader having a first and second surface, the first surface in thermal contact with the electronic chip set and adapted to provide unimpeded heat flow, and the second surface in thermal contact with the optoelectronic transducer.

3. The assembly of Claim 1, wherein:

the electronic chip set comprises a processor chip, a memory chip a signal processing chip, a switching chip, or any combination thereof; and

the substrate comprises a multi-chip module, a dual-chip module, a single-chip module, or any combination thereof.

4. The assembly of Claim 1, wherein the substrate is an organic or a ceramic substrate containing electrical interconnects.

5. The assembly of Claim 1, wherein:

the electrical signaling medium is a flexible printed circuit board; and

the substrate comprises a first major surface in communication with the electronic chip set, a second major surface opposing the first surface, and an edge surface disposed between the first and second surfaces.

6. The assembly of Claim 1, wherein the optoelectronic transducer comprises:

an integrated circuit in communication with the second end of the electrical signaling medium; and

a laser, a vertical cavity surface emitting laser, a light emitting diode, a photodiode, or other light emitting or photosensitive device array, in electrical communication with the integrated circuit.

7. The assembly of Claim 1, wherein the optical coupling guide is a set of alignment pins.

8. The assembly of Claim 5, wherein the first end of the flexible printed circuit board is in communication with the first major surface of the substrate.

9. The assembly of Claim 5, wherein the first end of the flexible printed circuit board is in communication with the second major surface of the substrate.

10. The assembly of Claim 5, wherein the first end of the flexible printed circuit board is in communication with the edge surface of the substrate.

11. The assembly of Claim 5, further comprising:

a printed circuit board in communication with the second major surface of the substrate; and

wherein the flexible printed circuit board is absent electrical signal interconnections except for electrical signal interconnections between the substrate and the optoelectronic transducer.

12. The assembly of Claim 9, wherein:

the second major surface of the substrate includes a shelf or recess; and

the first end of the flexible printed circuit board is in communication with the substrate at the shelf or recess.

13. The assembly of Claim 2, further comprising a second optoelectronic transducer in thermal contact with the second surface of the thermal spreader, the first and second optoelectronic transducers being offset from one another in at least one of a vertical direction and a horizontal direction.

14 The assembly of Claim 3 wherein the electronic chip set comprises signal multiplexing and coding functions for driving an e/o device directly, and functions for receiving a signal directly from an o/e device.

15. A method of communicating a signal from an electronic chip set, the electronic chip set adapted for at least one of data processing, data switching, and data storage, to another component in a computer system, comprising:

initiating an electrical signal at the electronic chip set and communicating the electrical signal to a substrate;

communicating the electrical signal from the substrate directly to a flexible printed circuit board via an electrical contact;

communicating the electrical signal from the flexible printed circuit board to an optoelectronic transducer and converting the electrical signal to an optical signal thereat; and

communicating the optical signal to an optical signaling medium for communication to another component in the computer system;

wherein the electronic chip set and the optoelectronic transducer share a common thermal path for cooling.

16. The method of Claim 15, further comprising:

transferring heat away from the electronic chip set at a first surface of a thermal spreader; and

transferring heat away from the optoelectronic transducer at a second surface of the thermal spreader.

17. The method of Claim 16, wherein the electrical signal comprises multiple electrical signals that are transmitted at the same time in parallel and further comprising:

communicating and converting the multiple electrical signals to multiple optical signals at multiple optoelectronic transducers;

off-setting the first and second electrical signals with respect to each other in at least one of a vertical direction and a horizontal direction at the second surface of the thermal spreader thereby increasing the density of the optical signals available at the second surface of the thermal spreader;

transferring heat away from the first and second optoelectronic transducers at the second surface of the heat spreader; and

communicating the first and second optical signals to an optical signaling medium for communication to another component in the computer system.

18. An optoelectronic assembly for a computer system, comprising:

an electronic chip;

a substrate in signal communication with the electronic chip;

a flexible printed circuit board having a first end in direct communication with the substrate via an electrical contact;

an optoelectronic transducer in communication with a second end of the flexible printed circuit board;

an optical coupling guide at the second end of the flexible electrical circuit for aligning an optical signaling medium with the optoelectronic transducer; and

a thermal spreader having a surface in thermal contact with the electronic chip and with the optoelectronic transducer;

wherein an electrical signal from the electronic chip is communicated to the optoelectronic transducer via the substrate and the flexible printed circuit board.

19. The assembly of Claim 18, wherein:

the thermal spreader comprises a second surface and the optoelectronic transducer is adjacent to and in thermal contact with the second surface of the thermal spreader.

20. The assembly of Claim 18, wherein:

the thermal spreader comprises a second surface;

the optoelectronic transducer is in thermal contact with the second surface of the thermal spreader, and further comprising:

at least a second optoelectronic transducer in thermal contact with the second surface of the thermal spreader, the first and at least a second optoelectronic transducers being offset from each other in at least one of a vertical direction and a horizontal direction.